

ABSTRACT

5 A teleoperator system with telepresence is shown which includes right and left hand controllers (72R and 72L) for control of right and left manipulators (24R and 24L) through use of a servomechanism that includes computer (42). ~~Cameras (46R and 46L) view workspace (30)~~ from different angles for production of stereoscopic signal outputs at lines (48R and 48L). In response to the camera outputs a 3-dimensional top-to-bottom inverted image (30I) is produced which, is reflected by mirror (66) toward the eyes of operator (18). A virtual image (30V) is produced adjacent control arms (76R and 76L) which is viewed by operator (18) looking in the direction of the control arms. By locating the workspace image (30V) adjacent the control arms (76R and 76L) the operator is provided with a sense that end effectors (40R and 40L) carried by manipulator arms (34R and 34L) and control arms (76R and 76L) are substantially integral. This sense of connection between the control arms (76R and 76L) and end effectors (40R and 40L) provide the operator with the sensation of directly controlling the end effectors by hand. By locating visual display (246) adjacent control arms (244R and 244L) image (240I) of the workspace is directly viewable by the operator. (Figs. 12 and 13.) Use of the teleoperator system for surgical procedures also is disclosed. ~~(Figs. 7-9 and Fig. 13.)~~

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